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Dr. Merriam's* records from the rice fields of South Carolina and Georgia, which the birds frequent until May 29, a date at which we generally consider the migration to be nearly completed and when their earlier comrades are already well established in their summer housekeeping.

OBSERVATIONS ON THE AVIFAUNA OF PORTIONS OF ARIZONA.

BY EDGAR A. MEARNS, M. D.

THESE observations are confined to the alpine regions of Arizona, which I explored during a residence of over four years in the Territory.

The mountain system of Arizona is a continuation of both the Rocky Mountain chain and the Sierra Nevada. In $43^{\circ} 30'$, north latitude, the Wind River range of the Rocky Mountains divides about the remote sources of the Great Colorado River. One branch trends southward, and passing around the sources of the Platte, the Arkansas, and the Rio Grande, is merged in the Guadalupe Mountains, and at last loses itself in the great prairie plains of the southwest. The other branch, turning to the west and south forms the Wasatch range, the eastern rim of the Utah Basin, and, widening out to the level of the great plateau, reaches the cañon of the Colorado, near 112° of longitude.

A branch of the Sierra Nevada deflects from that range east of Owens River, and, with a general trend to the southeast, passes by the head of the Virgin River, becomes merged in the plateau, and unites with the Wasatch at the Grand Cañon of the Colorado. These united ranges form the mountain system of Arizona, and south of the Colorado River break up into parallel ridges, isolated groups, detached spurs and peaks, which are again united in one massive chain in the Mother of Mountains in northern Mexico.

The San Francisco peak, volcanic in its origin, may be considered the apex of the Arizona mountain plateau, and the

*Dept. of Agriculture, 1886. Report of the Ornithologist and Mammalogist, pp. 248-249.

northern limit of the numerous ranges extending from the 35th parallel to the Sonora line, and from the 109th to the 113th degree of longitude. Grouped around it are numerous lesser peaks, mostly volcanic also, highest of which is Mt. Kendricks, having an altitude of about 10,200 feet.

From the San Francisco Mountains, a ridge extends southeast which separates the waters of the Little Colorado from those of the Gila. This is known as the Mogollon Range, while its southeastern spurs are known as the White Mountains. These ranges are well wooded, containing some of the finest timber to be found in the Territory. They are also fairly well watered by streams and springs, are adorned with many beautiful parks and elevated valleys, and covered with rich grasses and herbage.

West of the Mogollon, and running parallel with that range, is the Sierra Mazatzal. Its course is east of the Verde River, and south to Salt River. Its slopes and summit are covered with an abundance of pine, juniper, and oak; water is found in several streams and springs, and its valleys and foot-hills are covered with a fine growth of grasses and vegetation.

Between the Mazatzal and Mogollon are several detached spurs and short ranges. The largest of these—the Sierra Ancha, situated in what is known as Tonto Basin—is a flat-topped mountain, some thirty miles in length, covered with one of the largest and finest bodies of pine timber in Arizona.

Between the Salt and Gila Rivers are many mountain groups, some of which attain a considerable elevation. The most prominent are the Superstition Range, which rears its lofty and rugged front east of the great plains, stretching between the Salt and the Gila; the Pinal Range, which runs nearly parallel with the Gila, and whose northern slopes are heavily timbered; the Salt River and Apache Mountains, south of Salt River; the Gila Range, Sierra Natantes, and the Sierra de la Petahaya. Nearly all of these offshoots from the main ranges are well watered and timbered.

The vast region west of the Verde River, and extending from the Great Colorado to the Gila, is crossed by numerous mountain ranges. Running parallel with the former stream, and west of it, are the Verde Mountains. The northern end of this ridge is called the Black Hills, and is a massive elevation, covered with a heavy growth of timber. The northern slope of the Black Hills is

washed by the Verde, and running north of that stream is a range of hills that culminates in the Bill Williams Mountain, a prominent peak west of the San Francisco cone. The next range to the west of the Verde Mountains is the Bradshaw and the Sierra Prieta. This is one of the most magnificent mountain chains in Arizona. It may be said to begin at Granite Peak, ten miles north of Prescott and extends in a southeasterly direction to the wide plains which stretch along Salt River near its junction with the Gila, being about fifty miles in length by about twenty in average width, and clothed with fine pines, junipers and cedars. North of the Sierra Prieta, and thence to the Colorado Cañon, are numerous ranges, culminating in high, heavily timbered ridges, forming a considerable forest area to the south of the Colorado River.

The above enumeration, including all of the high ranges of mountains that lie between the Gila and Colorado Rivers in Arizona, defines the geographical limits under consideration. In ascending these mountain slopes, from the lower plateaus or *mésas*, the vegetation is seen to change in character with the altitude, giving rise to a remarkable succession of vegetable zones, following each other with more or less precision. When the forest region is attained, the western cedars (*Juniperus occidentalis* var. *monosperma* and *J. Californica*) and piñon or nut pine (*Pinus monophylla*) are the first trees encountered; then a zone of evergreen-oaks (*Quercus oblongifolia*, *Q. chrysolepis*, *Q. hypoleuca*, etc.), succeeded by belts of rough-barked juniper (*J. pachyphlæa*), deciduous oaks (*Quercus Gambelli*, etc.), pine (*P. ponderosa*), aspen (*Populus tremuloides*), firs (*Pseudotsuga taxifolia* and *Abies concolor*), and spruce (*Picea Engelmanni*), in the order named. The belt of yellow or bull pine (*P. ponderosa*), which constitutes the bulk of the forested areas of Arizona, is usually reached at an altitude of 5000 to 6000 feet above the level of the sea. Its lower limit coincides with the scope of this paper, which deals with the birds residing during the summer months within, or above, the zone of pine timber.*

As it is my object to emphasize the peculiar ornithological features stamped upon these elevated localities, those species which

**Pinus ponderosa* is the species referred to, when speaking of the pine belt. Several other species occur sparingly, among them *Pinus flexilis* and *P. reflexa* (white pines) at high altitudes, *P. Chihuahuana* interdigitating with the yellow pine along its lower margin, and *P. Murrayana* (black pine) forming considerable forests near the Colorado River.

barely reach the pine forests and are much more characteristic of the lower *mésas* and valleys are excluded,* although not a few of them breed occasionally among the oaks and pines at the lower border of this territory. These, together with the winter visitors and migrants passing through during spring and fall, would perhaps treble the number of species here given.

The summer residents of the mountain forests of northeastern Arizona comprise two marked classes; one representing a southern extension of the avifauna of the Rocky Mountains; the other a northern extension of the avifauna of the mountains of northern Mexico, along the Mogollon range. Those not included in either of these classes are mainly inhabitants of the surrounding regions, whose distribution is general. A few species, like the Californian Woodpecker (*Melanerpes formicivorus bairdi*), extend their habitat to this region from the west; while others, such as the Massena Partridge (*Cyrtonyx montezumæ*), reach it from the east or southeast; and a few appear to be mainly or wholly confined to this particular region during their season of reproduction, among them the Red-backed Junco (*Junco cinereus dorsalis*).

The following species are common to the Rocky Mountain region:—

Colymbus nigricollis californicus, *Merganser americanus*, *Anas boschas*, *Anas strepera*, *Anas americana*, *Anas discors*, *Spatula clypeata*, *Dafila acuta*, *Erismatura rubida*, *Porzana carolina*, *Dendragapus obscurus*, *Aquila chrysaetos*, *Haliaeetus leucocephalus*, *Nyctale acadica*, *Bubo virginianus subarcticus*, *Glaucidium gnoma*, *Dryobates villosus hyloscopus*, *Dryobates pubescens oreæcus*, *Picoides americanus dorsalis*, *Sphyrapicus thyroideus*, *Melanerpes torquatus*, *Colaptes cafer*, *Chordeiles virginianus henryi*, *Trochilus platycercus*, *Contopus*

*To be included in this category are the following species, all of which breed, at least occasionally, in the lower edge of the pine belt:—

Ardea virescens, *Callipepla gambeli*, *Urubitinga anthracina*, *Pandion haliaetus carolinensis*, *Geococcyx californianus*, *Dryobates scalaris bairdi*, *Trochilus rufus*, *Sayornis saya*, *Aphelocoma woodhousei*, *A. sieberii arizonæ*, *Carpodacus mexicanus frontalis*, *Spizella atrigularis*, *Peucaea ruficeps boucardi*, *Pipilo maculatus megalonyx*, *Petrochelidon lunifrons*, *Stelgidopteryx serripennis*, *Lanius ludovicianus excubitorides*, *Helminthophila luciae*, *Dendroica æstiva sonorana*, *Dendroica nigrescens*, *Geothlypis macgillivrayi*, *Geothlypis trichas occidentalis*, *Icteria virens longicauda*, *Sylvania pusilla pileolata*, *Mimus polyglottos*, *Catherpes mexicanus punctulatus*, *Thryothorus bewickii bairdi*, *Parus inornatus griseus*, *Parus wollweberi*, *Psaltiriparus plumbeus*, *Poliotilia cærulea*.

borealis, *Contopus richardsonii*, *Empidonax difficilis*, *Cyanocitta stelleri macrolopha*, *Perisoreus canadensis capitalis*, *Corvus americanus*, *Picicorvus columbianus*, *Cyanocephalus cyanocephalus*, *Xanthocephalus xanthocephalus*, *Sturnella magna neglecta*, *Scolecophagus cyanocephalus*, *Coccothraustes vespertina*, *Carpodacus cassini*, *Leucosticte australis*, *Spinus pinus*, *Spinus psaltria*, *Poocætes gramineus confinis*, *Zonotrichia leucophrys*, *Spizella socialis arizonæ*, *Pipilo chlorurus*, *Habia melanocephala*, *Piranga ludoviciana*, *Progne subis*, *Tachycineta thalassina*, *Vireo gilvus swainsoni*, *Vireo solitarius plumbeus*, *Dendroica auduboni*, *Salpinctes obsoletus*, *Troglodytes ædon aztecus*, *Certhia familiaris montana*, *Sitta carolinensis aculeata*, *Sitta canadensis*, *Sitta pygmæa*, *Parus gambeli*, *Regulus calendula*, *Turdus aonalaschkæ auduboni*, *Merula migratoria propinqua*, *Sialia arctica*.

In connection with this group of Rocky Mountain birds it should be remarked that the alpine mammals of these parts of Arizona afford an even more striking illustration of the southern extension of the Rocky Mountain fauna, as they are chiefly* sedentary species, occupying these peaks and elevated ridges throughout the year. The mammalian family Sciuridæ furnishes an interesting example: several Rocky Mountain forms — *Sciurus aberti*, *S. hudsonius mogollonensis*,† *Tamias asiaticus quadrivittatus* and *T. lateralis*—have their range in this region restricted to the high mountain-tops, where they are exceedingly plentiful. These highest points would appear, upon a map representing the geographical distribution of these species, as a chain of small islands in a sea having a widely different faunal character.

The flora of this region, which has been recently investigated, affords an exactly parallel case, these mountains appearing like islands in a region of more southern floral aspect.

The following species of mountain birds extend their habitat from northern Mexico into the mountains of this region: — *Meleagris gallopavo mexicana*, *Myiarchus lawrencei olivascens*, *Loxia curvirostra stricklandi*, *Piranga hepatica*, *Dendroica oliva-*

* Several of the larger animals, as the antelope, deer, and bears, descend to the lower valleys and mésas during the severest winter weather.

† A form of the red squirrel, intermediate between the common eastern chickaree and var. *fremonti* of the southern Rocky Mountain region.

cea, *Dendroica graciae*, *Setophaga picta*, *Cardellina rubrifrons*.

As restricted, the summer avifauna of this mountain region comprises, according to my observations, a hundred species.* This number will doubtless be considerably augmented upon thorough exploration.

Colymbus nigricollis californicus. AMERICAN EARED GREBE. — This handsome Grebe is very numerous on Stoneman's and the Mormon Lakes, where great numbers of them breed, as they also do at a small lake near Flagstaff. Their nests bear so close a resemblance to small floating masses of mud and herbage that they are difficult to discover, for which reason I overlooked them for some time. The eggs are covered, and the parents seldom go near them, at least during the daytime. On Stoneman's Lake they were so abundant that a couple of dozen were shot in an evening, three being killed at one shot. I caught one diving bird, as it came to the surface close beside my boat, but released it after obtaining its photograph.

Merganser americanus. AMERICAN MERGANSER. — I found this bird breeding in various mountain streams which pay tribute to the Verde and Salt Rivers. It also breeds on the upper courses of both of these rivers, nestlings having been procured as low as the vicinity of Fort Verde, on the Verde River.

Anas boschas. MALLARD. — This was found commonly on several lakes and streams in the Mogollons, during the months of May and June; and I think they were breeding, although I did not secure nestlings or eggs.

Anas strepera. GADWALL. — This species was common on the mountains, where there was water in sufficient quantity, and was probably breeding, although we failed to discover its nest.

Anas americana. BALDPATE. — A number of Baldpates were shot by my party at Mormon Lake during the latter part of May, 1887, at which time they were doubtless breeding. This lake is a shallow body of water, about fifteen miles in circumference, occupying a basin in the Mogollon Mountains, some forty miles southeast of the San Francisco peak. It is of variable size and depth, depending upon the rainfall, and was then so grown up with tulé, cat-tail, and other aquatic vegetation, that it resembled an immense field or marsh. As our only boat was a hollow log, so heavy that progress was both slow and laborious, our examination of this lake was far from being either complete or satisfactory. I felt sure that these Ducks were breeding there, although we could not find their nests. A male, shot on the 28th of May, was bleached to a pale drab color, with the markings much obscured, the green on sides of head not being apparent at all. Its quills were so worn and abraded that it certainly

* Probably several of these species do not breed in Arizona, their breeding having been inferred from their presence there in summer. The facts are so stated in all such cases.

could not have flown to any other body of water, as it was barely able to rise from the surface when closely pressed.

Anas discors. BLUE-WINGED TEAL.—Several were seen on each of the mountain lakes that we visited, but no positive proof of their breeding there was obtained, although it is probable that they do.

Anas cyanoptera. CINNAMON TEAL.—This remarkably handsome Duck was found breeding abundantly on the small lakes of the Mogollon Mountains during May and June.

Spatula clypeata. SHOVELLER.—Very abundant in the lakes of the Mogollons during May and June. They were probably breeding, although I obtained no other proof of it than their presence there in numbers at that season.

Dafila acuta. PINTAIL.—We learned from persons living near the Mormon Lake, that several kinds of Ducks breed in such considerable numbers on the lake that the Mormon settlers make a practice of gathering their eggs. The best season is during the latter part of May, and we were informed that an egg hunt had taken place about a week before our arrival, which perhaps accounts for our lack of success as eggers, they having gone over the same ground that we did. Although several species of Ducks, including the present one, were abundant, we found no eggs save those of the Teal.

Erismatura rubida. RUDDY DUCK.—A number of these beautiful Ducks were shot on Stoneman's Lake, at an altitude of 6200 feet, late in the month of May. They had acquired their full nuptial plumage, and undoubtedly would soon have been nesting, as a female taken contained an egg of considerable size. On Mormon Lake, also, a few were shot about the first of June; and we met with it again at Duck Lake, near Flagstaff, later in the season.

Plegadis guarauna. WHITE-FACED GLOSSY IBIS.—On the last day of May, 1887, we rode entirely around the Mormon Lake, exploring the edge as far as possible. Large flocks of these Ibises were found, and they were probably on their breeding ground. A wounded one was carried along by a member of the party, but it died, presumably of cold, on San Francisco Mountain.

Botaurus lentiginosus. AMERICAN BITTERN.—Breeds commonly in suitable places throughout these mountains. It was especially abundant at Mormon Lake, where it finds a most congenial home.

Nycticorax nycticorax nævius. BLACK-CROWNED NIGHT HERON.—Several were shot at Mormon Lake during the last days of May. There are several rookeries of this species in the cañons of the upper Verde and its tributaries. It is a permanent resident in the Verde Valley.

Grus mexicana. SANDHILL CRANE.—A few pairs breed at Mormon Lake, where a Mormon settler took its eggs in 1886.

Porzana carolina. SORA.—The Soras were abundant and very tame at the time of our visit to Mormon Lake. They were also found in several of the smaller lakes, and probably bred at Stoneman's Lake, where I took a pair on May 24.

Fulica americana. AMERICAN COOT.—Breeds abundantly in every reedy pool, at all altitudes. Several floating nests were found, but most of them were strongly moored to the reeds. At Mormon Lake a number of interesting nests were seen, which were protected from the fierce sun by a thatch of broken cat-tails. The dusky younglings, with their bright bills and orange-ornamented down, were seen in great numbers, in all stages of growth, during the months of May and June, playing at hide-and-seek amongst the rushes.

Actitis macularia. SPOTTED SANDPIPER.—These birds were apparently breeding at a small lake, in a crater-like depression at the summit of a volcanic peak arising near the western base of the San Francisco cone, the lake being at an altitude of from 10,000 to 10,500 feet. Near Baker's Butte, in the Mogollon range, I saw a young of the year, on the 28th of August, at the altitude of about 8,000 feet. It was in a thickly wooded place, where the only water was a little rill resulting from a recent rain storm. This bird also breeds in the low valleys of Arizona.

Ægialitis vociferus. KILLDEER.—Breeds in moist places up to 7000 feet. I cannot recall having seen it above that level.

Cyrtonyx montezumæ. MASSENA PARTRIDGE.—Rather scarce in most portions of Arizona. Its habit of squatting motionless upon the ground whenever an enemy approaches, renders it an easy prey to raptorial birds and other predacious animals, and this possibly accounts for its scarcity. It ranges downward into the foot-hills in winter; but in summer I have found it along the crest of the Mogollon ridge at various points. I have also known it to breed just below the pine belt, its lower range, therefore, slightly overlapping that of Gambel's Partridge. I did not meet with it on San Francisco Mountain, but its comparative scarcity and peculiar habits may have caused it to be overlooked.

Dendragapus obscurus. DUSKY GROUSE.—In the White Mountains of eastern Arizona, this Grouse is abundant. I searched for it in vain elsewhere. I fully expected to find it common on the San Francisco peaks. Our party ransacked them quite thoroughly, however, without discovering it, and we were told by the people who live there that none have been found. I learned from the Indians that there is another species of Grouse in the White Mountains, which I have not seen.

Meleagris gallopavo mexicana. MEXICAN TURKEY.—The Turkey breeds throughout these mountains. On the west side of San Francisco Mountain I found it nearly up to the timber line, and was informed by two shepherds who herded their sheep on the mountain that it occasionally even crosses the highest notches between these peaks, and so reaches the deep valley which they enfold upon the eastern side. It may be found at watering places in large flocks.

Columba fasciata. BAND-TAILED PIGEON.—A common resident of the pine forests of Arizona. It feeds largely on acorns and hence spends much time in the lower border of the pine zone, where oaks are numerous. While encamped on the Mogollon Mountains during the months of July and August, 1887, I observed that large numbers of Band-tailed Pigeons

roosted on the mountain at night, returning to their feeding ground amongst the oaks of Tonto Basin, about 2000 feet below, in the morning; late in the day they again resorted to the pine trees on the mountain. I did not find its nest in the pines, but procured both young and eggs in the cypress brakes on the mountain sides near the Natural Bridge on Pine Creek, in Tonto Basin, somewhat below the pine forests. It was quite common in the highest Mogollons and around the base of the San Francisco cone in May and June, at which season it spent much time in aspen groves.

Zenaidura macroura. MOURNING DOVE. — This Dove breeds, but is not generally common in the mountains. It was occasionally seen in open valleys at high levels. In an open space where I camped, on the base of the San Francisco cone, they were so numerous that one of the soldiers with me shot enough for a pot-pie for the whole party. The altitude of this camp was not far from 11,000 feet.

Cathartes aura. TURKEY VULTURE. — Seen soaring around the San Francisco peaks, and the highest backbone of the Mogollon range; but it generally breeds below the pine timber, often selecting caves for the purpose.

Accipiter velox. SHARP-SHINNED HAWK. — Occasionally seen in the mountains at all seasons.

Accipiter cooperi. COOPER'S HAWK. — Although resident through the pine belt, this Hawk is more common in the lower country, breeding abundantly in the wooded cañons of the foot-hills.

Accipiter atricapillus striatulus. WESTERN GOSHAWK. — An immature specimen, perhaps young of the year, started from an aspen thicket, not far from the timber line on San Francisco Mountain, June 7, 1887. An adult was seen, June 3, about five miles from the base of the mountain, in the pine woods. Another adult was seen in the upper edge of the cedar forest, below Stoneman's Lake, on May 21. All were too shy to be shot.

Buteo borealis calurus. WESTERN RED-TAIL. — Breeds commonly throughout the belt of pine timber, as well as on the lower mesas and in the deep valleys and cañons of Arizona.

Aquila chrysaëtos. GOLDEN EAGLE. — A young one, recently taken from a nest in a pine-tree in the great San Francisco forest, was seen in confinement by our party. We frequently saw a pair of these Eagles about the San Francisco peaks, in June. They were sometimes seen flying over the highest peaks. I once saw one fly towards a Clarke's Crow that sat on a dead tree. The Nutcracker made more clatter and outcry than a Flicker chased by a Hawk.

Halæetus leucocephalus. BALD EAGLE. — A pair of these birds has bred for many years past in a pine-tree near Stoneman's Lake, altitude 6300 feet. Possibly this represents the extreme southwestern limit of its known breeding range.

Falco mexicanus. PRAIRIE FALCON. — On the 4th of June, 1887, the windiest day I ever experienced, I succeeded with a companion in reaching the summit of Humphrey's Peak — the highest land in Arizona* —

*Altitude 12,562 feet (Wheeler).

and crawled up behind the monument built by Lieutenant Wheeler's party. We looked down upon the remaining half-dozen cones, joined by a ridge of horseshoe form, which constitute the San Francisco group, and into the cratered peaks arising from the surrounding plain, while snow-like masses of clouds rushed past us, and the pile of rocks behind which we were cowering vibrated in a gale so fierce that large pieces of volcanic scoria, thrown into the air, were swept along over the brink of a precipice in front of us. The only living things in sight, besides some mountain sheep, were two birds, in point of size inclining to extremes of the ornithological scale,—a Prairie Falcon and a Broad-tailed Hummingbird, which latter sought momentary shelter with ourselves. These, only, braved the wind and cold at the summit. The name of 'Prairie' Falcon scarce accords with my recollection of that scene.

On another occasion I climbed to the top of Agassiz Peak, which rises far above the timber line, being second only to Humphrey's Peak, and enjoyed a striking contrast of conditions. A calmer day one rarely sees, and I was glad to observe the birds that haunted this interesting spot of earth. A pair of Golden Eagles occasionally came into view; the glistening forms of Violet-green Swallows described endless figures and geometric designs; White-throated Swifts darted in and out amid the jagged rocks of the awful chasm enfolded by these peaks; and the vibrating notes of Rock Wrens drew my attention to a pair that climbed sturdily over rough piles of colored lavas. No other birds were seen; and the only mammal, save the mountain sheep, was a large spermophile (*Spermophilus grammurus*) whose sounding whistle proclaimed his presence far and near. Butterflies were very numerous; and bees and flies made bold to share my meagre lunch.

Falco peregrinus anatum. DUCK HAWK. — Resident at all altitudes, breeding on cliffs both in the mountains and in the low valleys of Arizona. It breeds regularly on the cliffs about Fort Verde, at the altitude of 3400 feet; and a specimen shot at the city of Tucson, May 7, 1885, was perhaps breeding in the neighboring Santa Catalina Mountains.

Falco sparverius. AMERICAN SPARROW HAWK. — Breeds very commonly throughout these mountains, as well as in the low districts of Arizona. At Forest Dale, near Fort Apache, I saw an interesting albinistic specimen having the entire body creamy white, except the rufous pattern of the back and tail, which was nearly of normal color.

Nyctale acadica. SAW-WHET OWL. — This Owl was heard regularly around the San Francisco Mountain where, near the north spring, I saw one sitting on a tall pine stump, ogling me from a deserted Flicker's burrow. It proved to be the female parent of three young and an egg, which form a series exhibiting the different stages of growth from the egg to a nearly full-fledged nestling.

Bubo virginianus subarcticus. WESTERN HORNED OWL. — Breeds commonly throughout Arizona; rather abundant in the timbered areas.

Glaucidium gnoma. PYGMY OWL. — Breeds regularly on these mountains. It is more apt to be discovered by its spiteful little enemies, the

Pygmy Nuthatches, than by ornithologists; and I am indebted to these little birds for most of my specimens. I took a female at Whipple Barracks, March 21, 1884; an old male was taken from an oak-tree on Pine Creek, in Tonto Basin, March 29, 1886; another captured at Banghart's Station, in Chino Valley, while surrounded by belligerent Plain Titmice, in a cottonwood hedge, on November 5, 1884; and one was killed at Baker's Butte, on the Mogollon Mountains, July 26, 1887. Its pleasant note was heard in the pine-trees overhead nearly every night while I was exploring the San Francisco group of mountains.

(*To be continued.*)

ADDENDUM TO 'A LIST OF THE BIRDS OF THE HUDSON HIGHLANDS, WITH ANNOTATIONS.'*

BY DR. EDGAR A. MEARNS.

[204. 1.] *Phalacrocorax dilophus* (Sw. and Rich.). DOUBLE-CRESTED CORMORANT.—An adult specimen taken at Cornwall, on the Hudson, October 10, 1883; others seen on the upper Hudson November 4, 1889. Measurements (No. 2627, Cornwall-on-Hudson, October 10, 1883, E. A. M.): length, 33.60; alar expanse, 53.65; wing, 12.90; tail, 7.80; culmen, 2.30; gape, 3.60; tarsus, 2.40; middle toe and claw, 3.20; middle claw, .47; outer toe and claw, 3.90; outer claw, .38; inner toe and claw, 2.33; inner claw, .47; hallux with its claw, 1.57; claw of hallux, .50 inch. Irides green. Feet and claws jet black. Gular pouch orange.

[52.1.] *Piranga rubra* (Linn.). SUMMER TANAGER.—I took a female in perfect plumage, at Highland Falls, New York, May 12, 1883. Measurements (No. 2583, E. A. M.): length, 7.00; alar expanse, 11.40; wing, 3.60; tail, 2.80; culmen, .60; gape, .77; tarsus, .74; middle toe and claw, .75; claw alone, .22 inch. Irides hazel. Bill greenish olive. Legs and feet bluish gray; claws brownish.

[52.2.] *Piranga ludoviciana* (Wils.). LOUISIANA TANAGER.—On December 21, 1881, while standing on a high point beside the Hudson, at Fort Montgomery, New York, I noticed a bird flying strongly from the north. It alighted in a tree top near me, and appeared animated and shy; thinking it was about to fly away, I shot it at once, and it proved to be a young male Louisiana Tanager, in good plumage, and fairly well nourished†. Measurements (No. 2244, E. A. M.): length, 7.45; alar expanse,

*Published in Bulletin of Essex Institute, Vols. X to XIII, 1878 to 1881.

†For its only previous capture east of the Mississippi River, see 'Forest and Stream,' Vol. X, p. 95.